

## Claims

1. A method of performing multiple polymerase chain reactions in a single vessel, comprising:

5 priming DNA synthesis on a template in a vessel with at least two sets of primers, wherein the primers are present in the vessel at a predetermined ratio, wherein the ratio is described by:

$$C_A = C_L (L_A \div L_L)^2$$

10 wherein  $C_A$  is the concentration of primers for an amplicon A; wherein  $C_L$  is the concentration of primer for the longest amplicon; wherein  $L_A$  is the length of the amplicon A; and wherein  $L_L$  is the length of the longest amplicon.

2. The method of claim 1 wherein the template is genomic DNA encoding p53.
3. The method of claim 1 wherein the template is a cDNA encoding p53.
4. The method of claim 1 wherein the primers amplify at least 2 exons of p53 selected from the group consisting of exons 2-11.
- 15 5. The method of claim 1 wherein the primers amplify at least 4 exons of p53 selected from the group consisting of exons 2-11.
6. The method of claim 1 wherein the primers amplify exons 2-11 of p53.
7. The method of claim 4 wherein the primers are selected from those shown in SEQ ID NO: 1-20.
- 20 8. The method of claim 5 wherein the primers are selected from those shown in SEQ ID NO: 1-20.
9. The method of claim 6 wherein the primers are shown in SEQ ID NO: 1-20.
10. The method of claim 9 wherein the primers are present in the following ratios:  
25 exon 2 (89.4): exon 3 (26.9): exon 4 (450): exon 5 (245.8): exon 6 (138.3):  
exon 7 (101.8): exon 8 (193.0): exon 9 (70.8): exon 10 (146.5): exon 11 (177.3).
11. A method of performing multiple polymerase chain reactions in a single vessel, comprising:

30 priming DNA synthesis on a genomic p53 template in a vessel with ten

sets of primers which amplify exons 2-11 of p53, wherein the primers are shown in SEQ ID NOS: 1-20, wherein the primers are present in the vessel at the following ratios: exon 2 (89.4), exon 3 (26.9), exon 4 (450), exon 5 (245.8), exon 6 (138.3), exon 7 (101.8), exon 8 (193.0), exon 9 (70.8), exon 10 (146.5), exon 11 (177.3).

- 5        12.    A kit comprising a set of primers for performing multiple polymerase chain reactions in a single vessel, comprising:

twenty primers having sequences as shown in SEQ ID NO: ID NOS: 1-

20.

- 10        13.    The kit of claim 12 wherein the ratio of the concentrations of the primers is described by:

$$C_A = C_L (L_A \div L_L)^2$$

wherein  $C_A$  is the concentration of primers for an amplicon A; wherein  $C_L$  is the concentration of primer for the longest amplicon; wherein  $L_A$  is the length of the amplicon A; and wherein  $L_L$  is the length of the longest amplicon.

- 15        14.    The kit of claim 12 wherein the ratio of the primers is: exon 2 (89.4): exon 3 (26.9): exon 4 (450): exon 5 (245.8): exon 6 (138.3): exon 7 (101.8): exon 8 (193.0): exon 9 (70.8): exon 10 (146.5): exon 11 (177.3).

- 20        15.    A mixture of primers for performing multiplex polymerase chain reaction, wherein the primers are present in the mixture at a predetermined ratio to each other, wherein the ratio of the concentrations of the primers is described by:

$$C_A = C_L (L_A \div L_L)^2$$

wherein  $C_A$  is the concentration of primers for an amplicon A; wherein  $C_L$  is the concentration of primer for the longest amplicon; wherein  $L_A$  is the length of the amplicon A; and wherein  $L_L$  is the length of the longest amplicon.

- 25        16.    The mixture of claim 15 which comprises at least 4 primers.  
17.    The mixture of claim 15 which comprises at least 6 primers.  
18.    The mixture of claim 15 which comprises at least 8 primers.  
19.    The mixture of claim 15 which comprises at least 10 primers.  
20.    The mixture of claim 15 which comprises at least 12 primers.  
30        21.    The mixture of claim 15 which comprises at least 14 primers.  
22.    The mixture of claim 15 which comprises at least 16 primers.

23. The mixture of claim 15 which comprises at least 18 primers.
24. The mixture of claim 15 which comprises at least 20 primers.